ing the follow-up period; however, 8-year cardiac mortality rates were 0%, 6% and 12%, respectively (log-rank test p = 0.008). Additionally, the difference was enhanced when analyzed with excluding 64 patients treated with a β-blocker during the follow-up period (0%, 7%, 15%, respectively; log-rank test, p = 0.006).
Conclusions: Postural response of HRV predicts risk for death in patients with CAD; particularly, postural LF increase (LF rise) is an independent risk for cardiac death.

1068-113 Abnormal Spatial Dispersion of QRS Duration Predicts Mortality in Patients With Mild to Moderate Chronic Heart Failure

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Background: The possible predictive value of spatial dispersion of QRS duration (S-QRSd) is unknown in patients with chronic heart failure (CHF). The aim of this study is to prospectively evaluate the prognostic significance of S-QRSd in patients with mild to moderate CHF, using the signal-averaged ECG.
Methods and Results: We studied 114 consecutive stable outpatients with radionuclide left ventricular ejection fraction < 40% (30±7%, NYHA: 2.0±0.6, ischemic origin: 54%) and 31 age and sex-matched normal controls. Signal-averaged ECG was recorded from standard 12 leads and 10 extra-precordial leads (two intercostal spaces upper and lower V1, V2 and V4-6). S-QRSd was defined as the difference between the maximum and minimum of filtered QRS duration in all of the leads. S-QRSd was significantly greater in CHF patients than controls (25.1±9.6 vs 15.9±4.6 ms, p<0.0001). Forty-three (Group I) of 114 CHF patients had abnormal S-QRSd (>25ms: mean+2SD of controls), while the remaining 71 patients (Group II) had not. There were no significant differences in clinical, hemodynamic, echocardiographic, biochemical parameters at the entry between Groups I and II. During the follow-up period of 47±18 months, 14 patients had cardiac death (sudden death in 9 and heart failure death in 5). Kaplan-Meier analysis revealed that the cardiac and sudden deaths were significantly more often observed in Group I than Group II (cardiac death: 28% vs 3%, p<0.0001, sudden death: 19% vs 2%, p<0.001). Relative risk for cardiac and sudden death in abnormal S-QRSd were 9.9 (95%CI 2.3 to 42.2) and 13.2 (95%CI 1.7 to 102), respectively. At multivariate Cox analysis, out of the variables including clinical, hemodynamic, echocardiographic, biochemical parameters, S-QRSd was the only predictor of the cardiac death (p<0.0001, hazard ratio 1.15 [95%CI 1.08 to 1.23]) and sudden death (p<0.0001, hazard ratio 1.14 [95%CI 1.07 to 1.22]).
Conclusion: Spatial dispersion of QRS duration in signal-averaged ECG is a powerful prognostic marker of the mortality in patients with mild to moderate CHF.

1068-114 QRS Duration on the Surface12 Lead ECG is an Independent Predictor of Mortality: A Study of 4,033 Patients With Known or Suspected Coronary Artery Disease

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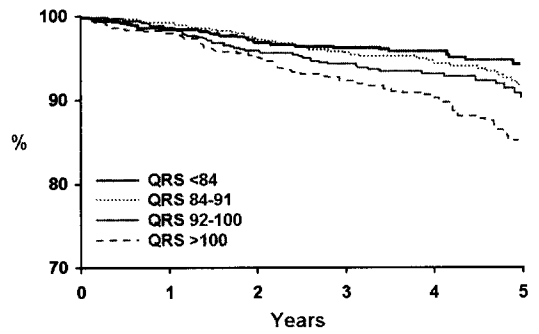
Rationale. Aim of this study was to assess the relation between QRS duration on the ECG and mortality in patients (pts) with known or suspected coronary artery disease (CAD).
Methods. We studied 4033 pts (age 62 ± 12 years, 2360 men) with known or suspected CAD (18% had previous myocardial infarction) who underwent symptom limited exercise echocardiography. QRS duration was automatically measured from the surface 12 lead ECG. An abnormal exercise echocardiogram was defined as resting or exercise-induced wall motion abnormalities.
Results: There were 252 deaths during a median follow up of 3 years. QRS duration was associated with an increased risk of death (RR = 8.5, CI 4.4 -16.4, p <0.0001). Survival curves of pts according to quartiles of QRS duration are shown in graph. In an incremental multivariate analysis of clinical, exercise, and echocardiographic data, independent predictors of mortality were age, gender, a history of previous infarction, diabetes mellitus (Chi^2 = 122), workload (Chi^2 = 193), and exercise wall motion score index (Chi^2 = 211). QRS duration was associated with an incremental risk when added to the clinical model (Chi^2 =133, p=0.009), exercise ECG model (Chi^2= 203, p=0.002) and echocardiographic model (Chi^2 = 216, p=0.03).
Conclusion. In pts with known or suspected CAD, a prolonged QRS duration is associated with an increased risk of death. This risk is persistent after adjustment to clinical risk factors, exercise capacity, resting left ventricular function and myocardial ischemia.



1068-115 QRS Duration is a Strong Predictor of Mortality in Patients Undergoing Electrophysiologic Studies

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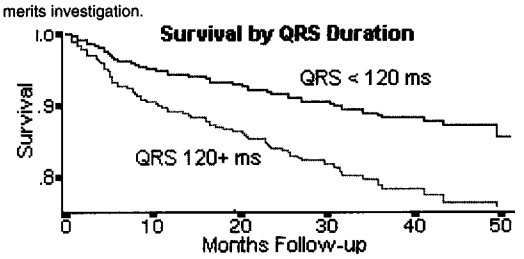
Background: Prolonged QRS duration in heart failure patients has been targeted for intervention with biventricular pacing, but whether QRS duration impacts mortality is not well studied. We tested the hypothesis that prolonged QRS duration independently predicts mortality in patients undergoing electrophysiologic study (EPS).
Methods: 975 patients without pacemakers undergoing EPS for risk stratification were studied. Mortality data were obtained from the Social Security Death Index. The relation between QRS duration and mortality was assessed using Cox regression.
Results: The mean age of subjects was 62.7 years, 709 (76%) were male, mean left ventricular ejection fraction (EF) was 35.6%, 619 (66%) had coronary artery disease (CAD), and 238 (25%) had inducible sustained monomorphic ventricular tachycardia (SMVT). Mean QRS duration was 120.4 msec. During a median follow-up of 34.6 months, 174 patients (19%) died. In univariate analysis, a QRS duration of 120 msec or greater was associated with a 2.9 fold increase in mortality (P < 0.001). Multivariable analysis showed prolonged QRS duration to be the strongest predictor of mortality (hazard ratio=2.1, P<0.001) after adjusting for age, EF, CAD, SMVT inducibility, beta-blocker therapy, and subsequent defibrillator implantation (figure).
Conclusion: Patients with prolonged QRS duration are at high risk for mortality. Whether shortening of QRS duration by biventricular pacing will reduce mortality in this high risk group merits investigation.



1068-116 Temporal Complexity of Repolarization and Mortality in Patients With Implantable Cardioverter-Defibrillators

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Background: Increased repolarization variability has been attributed to various cardiac conditions. However, data on its value in predicting adverse outcomes in high risk patients are scanty.
Methods: Forty-six patients with decreased left ventricular function and implantable cardioverter-defibrillators (ICD) had a high-resolution 10-minute ECG recordings. The patients were followed-up for 772 ± 278 days (mean ± SD) on average. The interval from the R-spike to the T-wave peak with maximum amplitude (RTmax) was determined automatically on beat-to-beat basis after deletion of cycles with premature depolarizations. Outliers were edited manually. Temporal beat-to-beat RTmax variability was analyzed using approximate entropy (ApEn) and the short-term scaling exponent (A1).
Results: Eight (17%) patients died during follow-up. The temporal beat-to-beat repolarization variability and heart rate variability parameters in patients who remained alive and who died are shown in Table. When RTmax-ApEn was tested together with the RR interval, RR-A1, and RR-ApEn in the Cox regression analysis, it still independently predicted mortality; hazard ratio = 3.42 (1.21-9.64, 95% CI, p=0.02) for every 0.10 increase in RTmax-ApEn.
Conclusion: Increased temporal complexity of repolarization (RTmax-ApEn) independently predicts mortality in ICD patients. Different nonlinear dynamics of repolarization and heart rate contribute to increased risk of mortality in ICD patients.

	Alive	Dead	p-value
RTmax-ApEn	1.00 ± 0.21	1.26 ± 0.13	0.002
RTmax-A1	0.62 ± 0.07	0.63 ± 0.09	0.57
RTmax, ms	295 ± 44	275 ± 34	0.28
RR-ApEn	0.94 ± 0.31	0.92 ± 0.28	0.90
RR-A1	0.96 ± 0.29	0.63 ± 0.23	0.003
RR, ms	989 ± 198	872 ± 213	0.13

1068-117 Prognostic Value of Nonlinear Measures of Heart Rate Dynamics in Chronic Hemodialysis Patients With Coronary Artery Disease

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Background: Altered nonlinear dynamics of heart rate are independent predictors of death in patients with coronary artery disease (CAD); but, the prognostic value in chronic hemodialysis patients with CAD is unknown.
Methods: In 81 chronic hemodialysis patients undergoing elective coronary angiography